

ANT ATTENDANCE AND NOCTURNAL FEEDING OF THE
LEAFHOPPER *SMICROCOTIS OBSCURA* KIRKALDY
(HEMIPTERA: CICADELLIDAE: LEDRINAE)

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Abstract

Smicrocotis obscura Kirkaldy feeds at night and is tended by ants of the genus *Camponotus*. Details of the ant-hemipteran association and the taxonomy of *Smicrocotis* Kirkaldy are discussed and compared with other known ant associations within related groups. *Smicrocotis sidnica* Kirkaldy is newly synonymised with *S. obscura*.

Introduction

Stenocotini is a tribe of relatively primitive leafhoppers currently containing six genera and 12 species, all confined to Australia and all feeding on the stems and branches of *Eucalyptus* (Evans 1966).

Smicrocotis was erected by Kirkaldy (1906) to contain a single adult female leafhopper from Cairns, Queensland, which he named *Smicrocotis obscura* Kirkaldy. Kirkaldy (1906) also mentioned a nymph from Sydney, NSW which he assumed belonged to the same species. He later named a second species, *S. sidnica* Kirkaldy, based on a male also from Sydney (Kirkaldy 1907). Distant (1907) described three species which Evans (1966) subsequently synonymised with *S. obscura*. Evans (1937, 1947) described two additional species in the genus, *S. solomoni* Evans from Crawley, WA and *S. brunneus* Evans from Sydney, NSW. Evans (1966) stressed that, because of sexual dimorphism and variation in colour and size, more material was needed before species limits could be determined with confidence.

Smicrocotis species have been recorded from a number of localities in all Australian States but no behaviour has been described.

Observations

During a visit to Orange, NSW, during 22-26 February 1997, the senior author observed numbers of the common sugar ant, *Camponotus consobrinus*, both large headed and normal workers, aggregating after sunset on the trunks of several species of young eucalypts in the grounds of Bloomfield Hospital, Orange. The area is planted with a variety of species of eucalypts from various localities.

The ants were attending *Smicrocotis obscura* (see Figs 1-3). All the eucalypts used as foodplants (*Eucalyptus saligna*, *E. pulverulenta* and other, unidentified species) were smooth trunked, with decorticating bark under which the leafhoppers moved when disturbed. The males were smaller, darker and more numerous than females. Uniformly coloured nymphs were also present and feeding. The ants tapped the leafhoppers with their antennae

and the latter expelled droplets of honeydew every 1-2 minutes and this was vigorously consumed by the ants. Each leafhopper was usually attended by three or four ants but up to 15 ants were seen in attendance of females on occasion. A newly moulted adult which had not yet fed also attracted ants and two ants were seen to be palpating nymphal exuviae. The leafhoppers were not aggregated and remained feeding until midnight, when observations were discontinued. Just before sunrise the leafhoppers had returned to their daytime retreats and few *Camponotus* remained on the eucalypts.

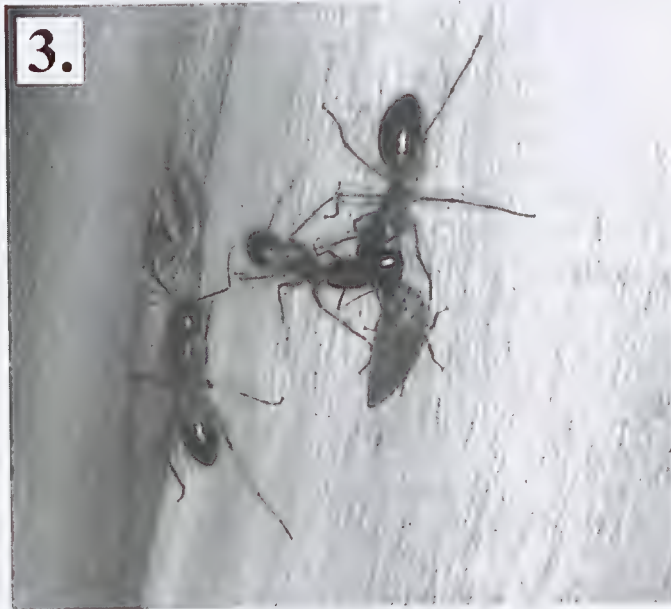
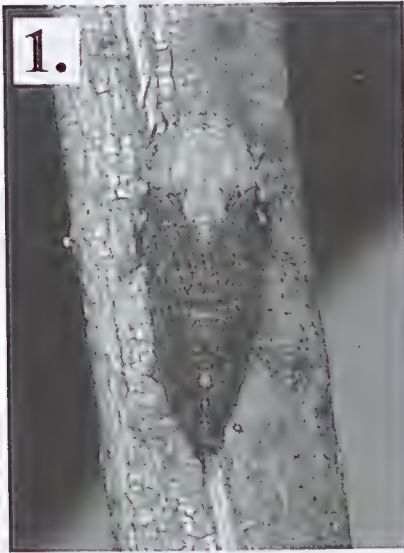
The leafhoppers emerge from under bark before dark and move around the tree, often in a crab-like fashion horizontally. The ants appear to locate the leafhoppers by chance and then attempt to palpate them. No honeydew is produced until the leafhopper starts to feed, which may be some distance from the initial contact point with the ants. At this stage the leafhoppers always have ants in attendance and neither the ants nor the leafhoppers are disturbed by torchlight. The ants were seen at night to be attacking termites on the eucalypts, but not the leafhoppers.

In the summers of 1998 and 1999, *S. obscura* was found again in February on the same eucalypts at Orange, NSW. Efforts were made to find their daytime retreats but without success. A cast nymphal skin which appears to be *S. obscura* was found on a mature eucalypt in nearby natural forest. *Camponotus* nests were abundant in the area though not restricted to near the bases of the eucalypt trees where the leafhoppers were found.

Shortly after the initial observation in 1997, Mr Lindsay Hunt (pers. comm.) also reported almost identical behaviour in *Smicrocotis* sp. at Scott Creek, Mount Lofty Ranges, near Adelaide, South Australia. On an unusually frosty night in late April he found numerous scattered leafhoppers, mostly females, usually attended by four to six *C. consobrinus*. The leafhoppers were feeding mostly on low branchlets. In October 1997, several nymphs were observed feeding in the same locality. In June 1999, large numbers of what appeared to be first instar nymphs of *S. obscura* were found under the bark of the trees at Scott Creek and subsequently also found at Orange. These observations suggest that the species has one generation a year, with eggs hatching in mid to late winter.

Taxonomy

Males of *Smicrocotis* from both Orange and Adelaide were identified by one of us (MF) from Evans' (1966) key to species as *S. sidnica*. The associated females keyed to *S. obscura*. Evans (1966) had reported that he had found only females of *S. obscura*. The three species which were synonymised with *S. obscura* by Evans (1966) are also based on female holotypes. The known distributions of *S. obscura* and *S. sidnica* are almost identical and they have often been collected together, but only males of the latter and only females of the former. It appears that *S. sidnica* and *S. obscura* are forms of the same sexually dimorphic species. Sexual dimorphism is also found in *Stenocotis depressa* and in other taxa of the tribe.



Figs 1-3. (1) Adult female *S. obscura*. (2) Adult female (upper) and nymph (lower) *S. obscura* with attendant ants at Orange, NSW. (3) Adult female *S. obscura* tended by *C. consobrinus* ants at Orange, NSW.

The full synonymy of *S. obscura* is therefore as follows.

Smicrocotis obscura Kirkaldy 1906: 370

Smicrocotis infuscata Distant 1907: 195, synonymised by Evans 1966: 109.

Smicrocotis pallescens Distant 1907: 195, synonymised by Evans 1966: 109.

Smicrocotis projecta Distant 1907: 196, synonymised by Evans 1966: 109.

Smicrocotis sidnica Kirkaldy 1907: 28, **syn. nov.**

Smicrocotis chelonia Evans 1937: 160, synonymised, with *S. sidnica* by Evans 1966: 109.

The validity of *S. brunneus* (Evans 1947) is doubtful since its known distribution (Sydney, NSW) and descriptive features fall within the range of *S. obscura*. Unfortunately, the holotype male lacks an abdomen so it is not possible to examine its genitalia (Day and Fletcher 1994).

Study of the male genitalia (by MF) of the holotype of *S. solomoni* Evans has revealed no differences from males of *S. sidnica* from Orange or Adelaide. However, the spination of the external edge of the hind tibiae differs. *S. obscura* has three small basal spines near the base and four large spurs evenly spaced towards the apex. *S. solomoni* has six spurs more or less evenly spaced and gradually increasing in size from base to apex. The significance of these differences is uncertain. For this reason, synonymy of *S. solomoni* with *S. obscura* is not proposed at this stage. A comprehensive study of the Stenocotini, including molecular, morphological and possibly acoustic data is required also to determine the validity of the genera of the Stenocotini and whether a similar level of synonymy exists within the genus *Kyphocotis* Kirkaldy.

The following species of the tribe Stenocotini, are currently recognised:

Anacotis hackeri Evans 1937

Kyphocotis claudenda (Walker 1858)

Kyphocotis nigrescens (Distant 1907)

Kyphocotis parva Distant 1907

Kyphocotis tessellata Kirkaldy 1906

Kyphoctella distorta Evans 1966

Ledracotis gunnensis Evans 1937

Smicrocotis brunneus (Evans 1947), nomen dubium?

Smicrocotis obscura Kirkaldy 1906

Smicrocotis solomoni Evans 1937

Stenocotis depressa (Walker 1851)

Discussion

This paper provides the first record of a member of the Tribe Stenocotini to be ant attended. However, unlike other species of Cicadellidae in which ant attendance has been observed, particularly the Pogonoscopini (Eurymelidae)

(Evans 1966, Day and Pullen 1999) and *Mymecophryne formiceticola* (Cicadellidae: Xestocephalinae) (Kirkaldy 1906, K. Chandler, pers. comm.), this association appears to be in a very early stage of development. The ants are providentially taking advantage of a food source and, by default, providing some measure of protection to the leafhoppers. There is no question, however, that there is a definite association because the leafhoppers tolerate the attentions of the ants and the ants do not attempt to attack the leafhoppers in the way they attack other insects on the same trees.

Other species of Stenocotini, including *Ledracotis gunnensis* and species of *Kyphocotis* are normally found sheltering under bark during the day and may also be night feeding, although no observation of this and therefore possible ant attendance, has been observed. The exception is *Stenocotis depressa* which is often seen actively moving on the exposed trunk during the day, but may not be feeding at this time.

Acknowledgments

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